

WHAT IS CLAIMED IS:

1. A cellular data packet, comprising:
 - a preamble for collision determination and synchronization;
 - a start-of-frame delimiter (SFD);
 - 5 a destination address (DA);
 - a source address (SA);
 - a routing information block (RIB); and
 - an informational field.
2. The cellular data packet of claim 1, wherein said informational field
10 comprises:
 - a type field for indicating whether said packet is a control packet or a service packet;
 - a status field;
 - a data field; and
- 15 a cyclic redundancy check (CRC) field, including error detection and correction information.
3. The cellular data packet of claim 2, wherein said type field comprises:
 - a two-byte protocol identifier;
 - a two-byte sub-protocol identifier; and
- 20 a two-byte service identifier.
4. The cellular data packet of claim 2, wherein said status field is configured to indicate whether said packet is an ACK or a NACK packet, the number of data packets pending, spread spectrum synchronization information, or whether said packet is native or routed.
- 25 5. The cellular data packet of claim 1, wherein said destination address comprises:
 - a region indicator for indicating a region location of a recipient user station;
 - a cell identifier for indicating a cell within said region; and
 - 30 a cellular IP address of said recipient user station within said cell.
6. The cellular data packet of claim 1, wherein said source address comprises:
 - a region indicator for indicating a region location of a transmitting user station;
 - a cell identifier for indicating a cell within said region; and
 - a cellular IP address of said transmitting user station within said cell.

7. The cellular data packet of claim 1, wherein said routing information block indicates a routing path of said packet from said transmitting/receiving user station to said base station.

8. The cellular data packet of claim 7, wherein said routing information block is 5 configured to indicate up to ten routing links between said transmitting station and said base station.

9. The cellular data packet of claim 1, wherein said packet is a variable-length data packet.

10. The cellular data packet of claim 9, wherein said packet has a maximum 10 byte-length of 512 bytes.

11. A method for routing a data packet within an intelligent cellular IP network, wherein a transmitting/receiving station is outside of an originating transmitting or destination receiving cell or blocked from said originating transmitting or destination receiving cell, comprising the steps of:

15 transmitting a data packet, including routing information indicating at least one intermediate recipient other than a base station;

receiving of said packet by said at least one intermediate recipient; and

transmitting said packet in accordance with said routing information from said at least one intermediate recipient to said receiving base station;

20 wherein said at least one intermediate recipient is a different transmitting/receiving station within said cell.

12. The method of claim 11, wherein said routing information is determined from a routing table specific to each of said transmitting/receiving stations.

13. The method of claim 12, wherein said routing table can be static or 25 dynamic.

14. A reduced collision cellular network for transmitting/receiving cellular IP data packets, comprising:

a plurality of cells distributed within said network, each of said cells associated with a certain frequency at a given time;

30 a base station located within each of said cells, configured to reshuffle said frequencies of adjacent cells according to a common timing reference and periodically transmit a synchronization burst to each of said plurality of cells; and

a plurality of user transmission/receiving stations located within each of said plurality of cells within said network, each of said user transmission/receiving stations

associated with a respective frequency hop number, wherein said transmission/receiving stations are configured to actively transmit/receive data packets if said associated frequency hop number is determined to be available, and wherein each of said user transmission/receiving stations within a respective one of said 5 plurality of cells remain synchronized to said base station based upon said periodic synchronization burst.

15. The cellular network of claim 14, wherein the common timing reference is determined from a global positioning satellite.

16. An cellular modem, comprising:

10 a radio frequency unit for transmitting/receiving data packets; and a baseband-to-intermediate frequency conversion unit, having a cellular network routing engine based on cellular IP, configured to covert the baseband information from a computer into intermediate frequency information for processing by said radio frequency unit;

15 wherein said modem is configured to serve as a router within said cellular network.

17. The cellular modem of claim 16, wherein said radio frequency unit is configured to operate in the MMDS, LMDS, ISM, ITFS and MDS spectrums.